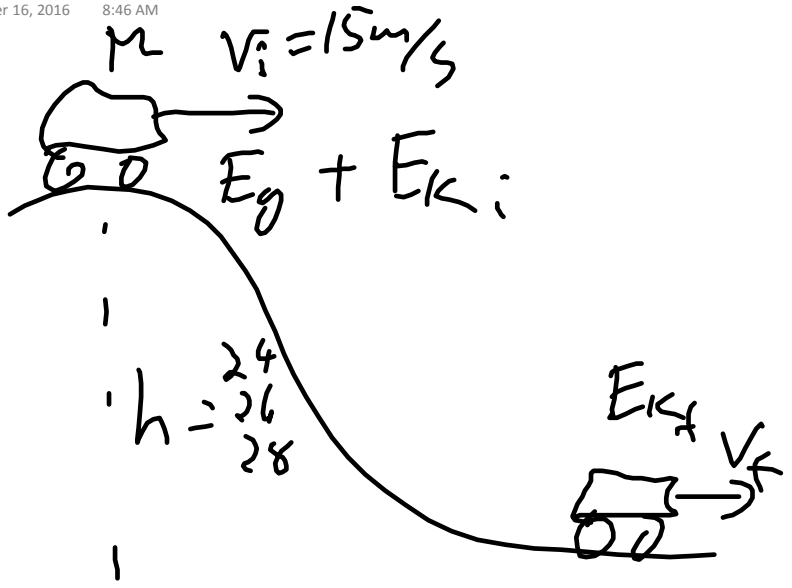

a) $F_f = 0$
$v_f = ?$

$$E_g + E_{K_i} = E_{K_f}$$

$$mgh + \frac{1}{2}mv_i^2 = \frac{1}{2}mv_f^2$$

$$v_f = \sqrt{2gh + v_i^2}$$

b) $E_g + E_{K_i} = E_{K_f} + E_{lost}$

$$mgh + \frac{1}{2}mv_i^2 = \frac{1}{2}mv_f^2 + E_{lost}$$

$$E_{lost} = mgh + \frac{1}{2}mv_i^2 - \frac{1}{2}m(v_f)^2$$

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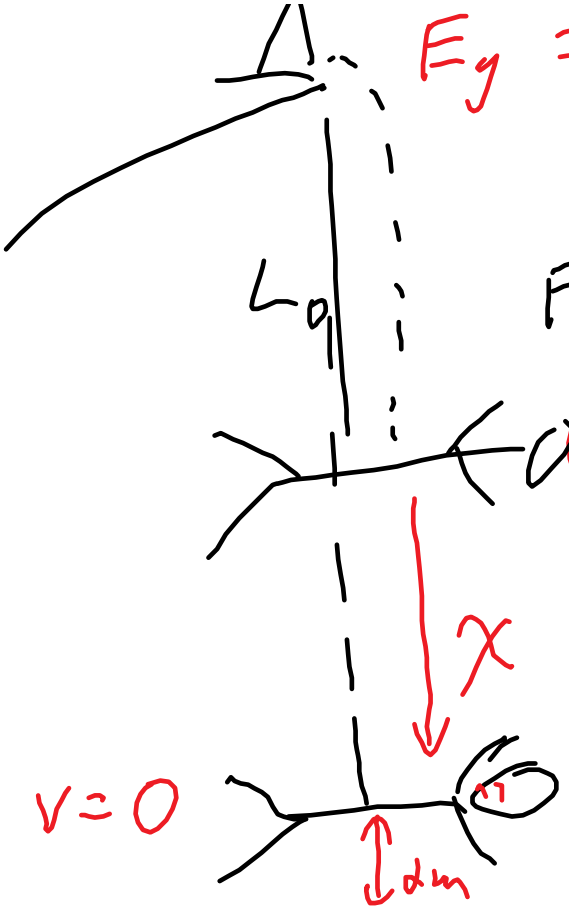
Q 2

$\therefore E_g = mg(h)$



$E_g = mg(h)$ $h = 28m$

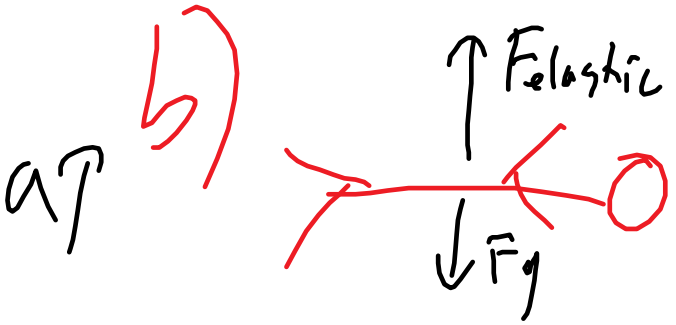
$E_{elastic} = \frac{1}{2}kx^2$

$mgh = \frac{1}{2}kx^2$

$x = \sqrt{\frac{2mg(28)}{200 N/m}}$

$L_0 = 28m - x$

b)



$F_{net} = ma$

$F_{elastic} - F_g = mg$

$a = \frac{kx - mg}{m}$

https://www.youtube.com/watch?v=66Uxb561L0Q#t=171.887063